

# High Achieving Countries Don't Narrow

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FOR AMERICAN EDUCATORS AND POLICYMAKERS, international tests of math and science achievement tell a discouraging tale. Consider the results of the latest round of Programme for International Student Assessment (PISA) testing, conducted in 2006.<sup>1</sup> American 15-year-olds ranked 21st in science and 25th in math among the 30 industrialized nations that comprise the Organisation for Economic Cooperation and Development (OECD).<sup>2</sup> Our students lagged behind their peers in top-scoring Finland by roughly two full grade levels in both subjects. Not only our rankings, but also our average scores in both subjects, were closer to those of Mexico (the lowest performing OECD member) than those of the Finns.

Of course, this is hardly news. International assessments of student achievement have been conducted for several decades now, and the story has been much the same. To be sure, there are occasional bright-spots—glimmers of hope that suggest the potential for reform to bring about broad improvement. Massachusetts and Minnesota, stand-out states on our own National Assessment of Educational Progress, participated separately on the 2007 Trends in International Math and Science Study (TIMSS) and more than held their own, ranking among the highest performing countries.<sup>3</sup> Yet the overall picture that emerged from TIMSS was no different than that from PISA. Though American students performed slightly above the international average, reflecting the broader set of countries participating in that assessment, they still trailed students from our chief economic competitors by considerable margins in both subjects.

Some commentators have urged caution in interpreting this evidence, usually on the grounds that the U.S. is unique in its commitment to educating all of its students. This objection, once worthy of consideration, is no longer tenable. While the world's leader in educational attainment for most of the Twentieth Century, the U.S. now ranks in the middle of the pack in terms of the share of students graduating from high school and college. And the very same PISA assessments show that the influence of socioeconomic background on student achievement

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is actually stronger in the U.S. than in the typical OECD country.<sup>4</sup>

Other skeptics take the results at face value but assert that they do not much matter, at least for the economic outcomes to which they are so often linked in public debate. Researcher Gerald Bracey, for example, has suggested that we lack “data on the relationship between the economy’s health and the performance of schools. Our long economic boom suggests there isn’t one—or that our schools are better than the critics claim.” If we’re so dumb, in other words, then why are we so rich?

Bracey’s critique may not sound so compelling in the present economic climate. Still, it is worth noting the growing evidence that the knowledge and skills measured by these tests do indeed influence national economic success. The latest and most convincing analysis comes from economists Eric Hansuhek and Ludger Woessmann, who combined data from 36 international tests administered between 1964 and 2003 to develop a comparable measure of educational achievement for 50 countries.<sup>5</sup> This measure turns out to be a powerful predictor of national economic growth between 1960 and 2000, even taking into account initial levels of economic development and the number of years of schooling students receive.<sup>6</sup> With the world growing “flatter” by the day, the urgency of ensuring that our students are prepared to compete in the global economy is clear.

We *are* behind—and it matters. The question, as Lenin once put it, is what is to be done?

## TAKING CONTENT SERIOUSLY

The premise of this report is that valuable guidance may be found in the documents that shape the content of

education offered to students in high-performing countries. In particular, we are provided with excerpts from curriculum standards and assessments from an otherwise diverse group of nine countries that have all consistently outperformed the U.S. on the PISA exams, which have been administered on three occasions since 2000.

The performance gap between American students and their peers in these countries is substantial. PISA scores are scaled such that the mean score for OECD countries is 500, with a standard deviation across the same set of countries of 100. In 2006, American students received an average score of 489 in science and 474 in math, lagging the OECD average in both subjects. The average across the nine countries included in this report, by contrast, was just above 530 in both subjects — more than one grade level higher than the U.S. in science and almost two full grade levels higher in math.

This report is but one of many that have attempted to look abroad to inform debates over education policy. Indeed, a large body of systematic research now links the relative standing of national school systems to alternative policies and practices.<sup>7</sup> What is novel, however, is the report's focus on questions of content. Guiding its selection of materials is the theory that a rigorous curriculum rich in a wide range of subject content matters greatly for students' academic success, over and above the policies and systems of governance that shape how that content is delivered. It therefore contains materials that shed light on the way in which the world's leaders in math and science treat components of a traditional liberal arts and sciences curriculum, such as literature, history, physics, music, and the visual arts.

#### CONTENT AND NO CHILD LEFT BEHIND

These materials hold great relevance for ongoing debates over the direction of American education policy in the era of No Child Left Behind (NCLB). This massive federal law represents the culmination of a decades-long bipartisan push to hold schools accountable for student achievement in core academic subjects — a push that was itself heavily influenced by concerns about the performance of American students relative to their peers abroad.<sup>8</sup> And there is considerable evidence that test-based accountability can be effective in raising student achievement in tested subjects. In particular, states that adopted accountability systems in the 1990s improved their math and reading performance on the National Assessment on Educational Progress against states that did not adopt accountability systems.<sup>9</sup>

Yet this approach to education reform carries with it important risks. Some observers fear that, even if accountability systems can be expected to improve skills in tested subjects, these gains will come at the expense of performance in subjects that go untested — and will

therefore go untaught. In addition, even in tested subjects there is the danger that schools may respond to accountability pressures by adopting a narrow emphasis on skills rather than content that may ultimately undermine student performance across the board. Such a content-light approach may be reinforced by the use of tests that are not aligned to high-quality curriculum standards.

Enacted in 2002, NCLB now requires states to test students annually in grades 3–8 (and once in high school) in reading and math. States must also test students in science, but these tests need only be administered in three grades and do not have to be used to determine whether schools are making “adequately yearly progress.” Other core academic subjects, including history, are altogether excluded from the law's testing mandates.

The extent to which curricular narrowing has already occurred remains difficult to gauge, as does the extent to which any such narrowing is attributable to specific policies like NCLB. To be sure, there is widespread anecdotal evidence of under-performing schools cutting back on

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instruction in untested subjects in an effort to boost proficiency in reading and math.<sup>10</sup> In addition, 44 percent of district officials surveyed by the Center on Education Policy during the 2006–07 school year reported that their schools had increased instructional time in reading and math since 2002 while cutting back on the time spent on other subjects, often by substantial margins.<sup>11</sup> Yet there is good reason to be skeptical of the responses of district officials, who are generally far removed from the practices at specific schools and may be inclined to exaggerate the extent to which NCLB has distorted their educational programs.

In my view, the most useful evidence on this issue comes from the Schools and Staffing Survey, which has been conducted by the U.S. Department of Education at regular intervals since the 1989–90 school year. This survey asks classroom teachers about the amount of time devoted to instruction in various subjects in a context not explicitly linked to the issue of curricular narrowing. My recent analysis of the data collected in 2003–04 school year confirmed that the initial implementation of NCLB was in fact associated with modest declines of 23 and 17 minutes per week in the amount of time elementary school teachers spend on science and history, respectively. Looking over a longer time period that encompasses the years in which many states adopted accountability systems prior to NCLB, the changes in elementary school

**Table 1: Instructional Time as a Percentage of Time Spent on Instruction in Core Academic Subjects, Grades 1-6, 1994–2004**

	1993–94	1999–2000	2003–04	Change, 1994–2004	Percent Change, 1994–2004
Reading/English Language Arts	47.8	48.3	51.9	+4.1	+8.6
Mathematics	23.6	25.7	24.7	+1.1	+4.7
Science	14.1	12.5	11.3	-2.8	-19.9
History/Social Studies	14.4	13.6	12.1	-2.3	-16.0
Total	100.0	100.0	100.0	-	-
Sample size	8,376	7,244	7,397	-	-

Note: Columns may not sum to 100 due to rounding. The sample includes all full-time teachers of self-contained classrooms in grades 1–6. Source: Schools and Staffing Survey, U.S. Department of Education, various years; table adapted from Martin West, “Testing, Learning, and Teaching: The Effects of Test-Based Accountability on Student Achievement and Instructional Time in Core Academic Subjects,” in Chester E. Finn, Jr. and Diane Ravitch, eds., *Beyond the Basics: Achieving a Liberal Arts Education for All Children* (Thomas B. Fordham Institute, 2007).

curricula become more pronounced: a 20 percent decline in share of time spent on science and a 16 percent decline in the share spent on history (see Table 1).

These patterns indicate that the changes in time allocation in American elementary schools through the 2003–04 academic year were less pronounced than the heated rhetoric surrounding the issue of curricular narrowing would suggest. Nonetheless, they do suggest that the emphasis placed on reading and math by NCLB and its state level predecessors has reduced students’ exposure to other subjects in the elementary grades. And it is possible, perhaps even likely, that these changes have accelerated in the four years since the last survey was conducted.<sup>12</sup>

Have these changes been detrimental? If so, are they nonetheless necessary if we are to improve student achievement in the building-block subjects of reading and math? What can we learn about these questions from the materials from other nations presented in this report?

#### LIMITATIONS AND LESSONS

At the outset, it is essential to note several limitations on the evidence presented. Inevitably, the excerpts are drawn from disparate sources in each country and seem to play somewhat different roles in their national education systems, making comparisons among them and to the U.S. difficult. In some cases, the materials are from national curricula that presumably play a role analogous to state content standards in the U.S. In others, we have snippets of exams administered either to all graduating students or to those intending to pursue a post-secondary degree. In the case of Australia, the national assessment of civics and citizenship excerpted here is administered

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to a representative sample of students every third year in a manner similar to the NAEP. In no country are we able to assess whether these materials are actually used in the classroom.

Equally important to keep in mind is the fact that the excerpts come only from high-performing countries. In the language of social science, the sample of countries has been selected based upon the dependent variable — or the outcome that we would like to explain. This leaves open the possibility that, were we to look at another sample of countries performing at the same level as the U.S., we would find curricula that are equally rich yet somehow not transmitted to students as effectively. To the extent that we see high-performing countries providing students with a comprehensive liberal arts education, we learn that a more narrowly focused approach is not necessary for success in math and science. But this evidence, on its own, cannot demonstrate that a comprehensive curriculum plays a role in their successes.

Nonetheless, the excerpts are provocative. Particularly striking are the time allocations charts from Korea, which specify the minimum number of hours to be devoted annually to each subject for students in grades 3–10. In the elementary grades, Korean students are to be provided with at least two hours of instruction each week in both

music and art. Looking only at the core academic subjects of Korean language arts, math, science and social studies, we see that the time minimum specified for language arts exceeds that for science and social studies by only a factor of two. As Table 1 above shows, the amount of time actually devoted to reading instruction in U.S. elementary schools is more than four times that devoted to science and social studies.

The materials from several other countries likewise suggest that, at least as a matter of policy, they place considerable emphasis on subjects beyond those assessed by PISA. We see that the high-flying Finns have a national curriculum that specifies clear content standards not only in physics and chemistry, but also in history and in music, with students expected to develop vocal skills and become familiar with the nation's musical heritage. Exit exams administered to students completing high school in British Columbia probe students' knowledge of history and literature in remarkable depth. The Swiss Matura exam includes questions about the timing of the American Revolution and asks them to interpret and analyze a primary document from the Cuban Missile Crisis with minimal guidance as to its context. Though strong conclusions would be unjustified, these and other high-performing countries seem to prioritize providing their students with a comprehensive curriculum encompassing the full range of the traditional liberal arts.

If that is the case, then these documents demonstrate that a narrow focus is not essential to performing well in science and math. They cannot definitively show why the student achievement in the United States falls short that of our international competitors in math and science. They do, however, confirm that an exclusive focus on those subjects is not essential in order to get ahead.